National Census Geography
Some lessons learned and future challenges in European countries

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Overview

- Definition of national census geography
- Criteria to delineate EAs
- Census methodology
- Traditional – Combined - Register-based censuses
- Geospatial information in traditional and combined censuses
- Geospatial information in register-based censuses
- Traditional versus Register
- A flexible and complex census geography
- Grid versus administrative maps
Definition of national census geography

- The administrative areas for which census data will be reported, and for some of them, disseminated.
- List of all administrative, geographic and statistical units in the country, with their relationships.
- Consists of a hierarchy of administrative and non-administrative units.
- Every country has its own specific administrative hierarchy.
Definition of national census geography

Simple census geographic:
- country
  - region
    - province
      - district
        - sub-district
          - rural locality
            - enumeration area
          - urban locality
            - ward
              - enumeration area

Complex census geographic:
- country
  - region
    - province
      - district
        - sub-district
          - rural locality
            - enumeration area
          - urban locality
            - ward
              - enumeration area
              - Small-area statistics
            - neighborhood
              - development areas
                - catchment areas for services
              - traffic zones
                - workplace zone
                - postal codes
              - electoral districts
Criteria to delineate EAs

- Be mutually exclusive and exhaustive with associated unique ID codes
- Have easily identifiable boundaries on the ground
- Be consistent with the **administrative** hierarchy
- Be consistent with **statistical** and **geographic** entities
- Be of approximately equally sized population
- Be small enough and accessible to be covered by an enumerator
- Be large enough to guarantee data privacy
- Be useful for other types of data collection activities.
Census methodology

Which census geography for which census method?

• Traditional?

• Combined?

• Register-based census?
Traditional – Combined - Register-based censuses

• **Traditional census:** field enumeration with no use of registers or administrative data – *census geography for planning, fieldwork, dissemination*

• **Combined census:** field enumeration associated to data from registers and/or other statistical surveys - *census geography for planning, fieldwork, dissemination*

• **Register-based census:** full use of registers and administrative data – *census geography for dissemination*
### Traditional – Combined - Register-based censuses in UNECE Region*

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>CENSUS METHOD</th>
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<tbody>
<tr>
<td>Albania</td>
<td>Traditional</td>
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<td>Andorra</td>
<td>Register-based</td>
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<td>Armenia</td>
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<td>United Kingdom</td>
<td>Traditional</td>
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<td>Uzbekistan</td>
<td>Mini-census</td>
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* Economic Commission for Europe, Paris, 6-8 June 2012
Traditional – Combined - Register-based censuses in UNECE Region

*Economic Commission for Europe, Paris, 6-8 June 2012*
Traditional, Combined, Register-based censuses in Europe

In comparison to the 2000 census round:

- Less number of European countries conducted a traditional census in the 2010 round
- Larger number of European countries conducted a combined or a register-based census in the 2010 round
- Census geography more complex, and geospatial tools widely used by almost all UNECE countries
Expectations from register-based census

- Reduced costs
- Reduced burden of respondents
- Reduced time to produce census outputs
- Better coverage and quality of census data

Coverage and data quality depends on the quality of registers, including geospatial information
Conditions for register-based census

- Legal framework. Use of administrative data for statistical purposes, data protection

- **Registers.** Availability of comprehensive and reliable registers (population, building/dwelling, addresses)

- Institutional cooperation. Access to registers

- Acceptance from the people. Transparency

- Nationwide unique ID numbers. IDs for persons, business units, *dwellings, addresses with numbers*
Geospatial information in traditional and combined censuses

- **Planning.** Subdivision of the territory into administrative, geographic and statistical units, demarcation of EAs, preparation of census maps, coding scheme, development of spatial databases

- **Fieldwork operations.** Support for logistics, monitoring coverage

- **Dissemination of census data.** Thematic maps, production of geo-referenced census data, atlases, Web GIS
Geospatial information in traditional and combined censuses - common elements in the 2010 round in Europe

- GIS tools and spatial databases widely used
- Few countries used paper-based sketch maps
- More use of addresses
- More geocoded data and more georeferencing
Geospatial information in traditional and combined censuses - some lessons from the 2010 round

- In traditional and combined censuses, GIS improved census coverage, but analyses are needed for validation (PES and other evaluation methods)

- New availability of GIS infrastructures for statistics in many European NSOs: sample frames for household surveys, NSDI

- Base spatial infrastructure for future building and dwelling registers, or addresses?
Geospatial information in register-based censuses - some lessons from the 2010 round

- **GIS** used for registers of dwellings/buildings and for addresses

- **GIS** used for dissemination: point-based locations of buildings using map coordinates

- **point-in-polygon analysis** used to define statistical areas such as localities or settlements, urban/rural areas, catchment areas, postal codes, grid squares
Traditional versus Register or ...versus quality and cost reduction?

• No optimal census approach. It depends on the national context

• The objective should be quality and reducing costs

• Need to develop a complex national census geography ready to be used for any census method, including geocoding population by points

• A main focus should be the improvement of census coverage
A flexible national census geography

• To be used in traditional, combined, register-based censuses
• To be based on a complex and flexible system of administrative, geographic and statistical units
• To include a grid system for coding of buildings/addresses
• Use of nationwide unique ID numbers for addresses, buildings and dwellings

Benefits for the 2020 round:
• expected improvement of census coverage
• Improved potentialities to develop building and dwelling registers
A flexible and complex census geography - Example

Geocoding approach:

Buildings coded by grid cell (UTM) and by EA or by address

Dwellings coded by building entrance or by building centroids

Advantages:
• coding scheme not dependent on administrative units changes and flexibility to aggregate census data by EA and/or grid for dissemination
Grid versus administrative maps - Example

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Thank you!

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Questions, comments?